

WHAT IS CLAIMED IS:

1. An image reading apparatus which reads images of original copies comprising:

a first sensor including several light receiving elements arranged in a main scanning direction,

a second sensor including several light receiving elements arranged in a main scanning direction with predetermined distance away from said first sensor in a sub scanning direction,

a first output unit which outputs pixel signals received from each light receiving element of said first sensor in the arrangement order of the light receiving elements,

a second output unit which outputs pixel signals received from even-numbered light receiving elements of the light receiving elements constituting said second sensor in the arrangement order of the light receiving elements,

a third output unit which outputs pixel signals received from odd-numbered light receiving elements of the light receiving elements constituting said second sensor in the arrangement order of the light receiving elements,

a first reading unit which adds up pixel signals sequentially output from said first output unit to be consecutive pixel units, and outputs the added pixel signals,

a second reading unit which outputs the pixel signals

sequentially output from one of said second and third output unit as pixel signals, and

a mode selecting unit which operates said first reading unit when a command for a quality oriented reading mode is externally provided for an operation mode of the image reading apparatus, and operates said second reading unit when a command for a speed oriented reading mode is provided.

2. The image reading apparatus as set forth in Claim 1, wherein said first output unit is designed to synchronize a transfer clock externally input, to transfer pixel signals received from each light receiving element of said first sensor to an adding unit in the arrangement order of the light receiving elements, to output pixel signals added by the adding unit, and to eliminate pixel signals added by said adding unit when reset signals are externally input in synchronization with said transfer clock,

wherein said first reading unit outputs pixel signals added to be consecutive pixel units from said first output unit by setting the cycle length of reset signals input into said first output unit at an integral multiple of the cycle length of said transfer clock, and outputs pixel signals output from the first output unit.

3. The image reading apparatus as set forth in Claim 1,

further comprising:

a standard image for brightness determination set at a position where said each sensor can read images, and

a standard image reading unit which acquires pixel signals obtained by reading said standard image by using any of said first, second and third output units

wherein said mode selecting unit is designed so that said mode selecting unit compares a standard value for brightness determination with evaluation value acquired from calculations based on pixel signals read by said standard image reading unit, and said mode selecting unit operates said first reading unit when said evaluation value indicates that it is darker than the state indicated by the standard value.

4. The image reading apparatus as set forth in Claim 1, further comprising a sub scanning unit which changes the relative position of said each sensor and an original copy into a sub scanning direction at a travel speed externally set,

wherein said mode selecting unit sets the travel speed of said relative position changed by said sub scanning unit depending on duration for outputting the amount of pixel signals of one main-scanning movement from one reading unit corresponding to an operation mode of the image reading apparatus.

5. The image reading apparatus as set forth in Claim 1, wherein the pixel density of the first sensor in the main scanning direction and the pixel density of the second sensor in the main scanning direction are the same.

6. The image reading apparatus as set forth in Claim 5, further comprising a third reading unit which outputs pixel signals output from one of said first output unit and a group of said second and third output units as pixel data,

wherein said mode selecting unit operates said third reading unit when a command for fine reading mode is externally sent for an operation mode of the image reading apparatus.

7. The image reading apparatus as set forth in Claim 5, wherein

said second sensor is arranged so that the position of each light receiving element consisting the second sensor along with the main scanning direction can be set between light receiving elements consisting the first sensor,

the image reading apparatus further comprising a fourth reading unit which outputs pixel signals sequentially output from said first, second and third output units as pixel signals,

wherein said mode selecting unit operates said fourth reading unit when a command for super fine reading mode is

externally provided for an operation mode of the image reading apparatus.

8. The image reading apparatus as set forth in Claim 5, further comprising:

a fifth reading unit outputs pixel signals sequentially output from the first output unit as pixel signals, and

a sixth reading unit outputs pixel signals sequentially output from the second and third output unit as pixel signals,

wherein the mode selection unit selectively operates one of the fifth and sixth reading units when the reading resolution specified by an external command is equivalent to the pixel density of the first and second sensor.

9. An image reading apparatus which reads images of original copies comprising:

a first sensor including several light receiving elements arranged in a main scanning direction,

a second sensor including several light receiving elements arranged in a main scanning direction with predetermined distance away from said first sensor in a sub scanning direction, and its position which is along the main scanning direction of each light receiving element is placed between each light receiving element constituting said first sensor,

a first output unit which outputs pixel signals received from each light receiving element of said first sensor in the arrangement order of the light receiving elements,

a second output unit which outputs pixel signals received from even-numbered light receiving elements of the light receiving elements constituting said second sensor in the arrangement order of the light receiving elements,

a third output unit which outputs pixel signals received from odd-numbered light receiving elements of the light receiving elements constituting said second sensor in the arrangement order of the light receiving elements,

a first reading unit which adds up pixel signals sequentially output from said first output unit to be consecutive pixel units, and outputs the added pixel signals,

a second reading unit which outputs the pixel signals sequentially output from one of said second and third output unit as pixel signals, and

a third reading unit which outputs the pixel signals output from one of said first output unit and a group of said second and third output units as pixel data,

a fourth reading unit which outputs pixel signals sequentially output from said first, second and third output units as pixel signals, and

a mode selecting unit which operates said first reading unit when a command for a quality oriented reading mode is

externally provided for an operation mode of the image reading apparatus, operates said second reading unit when a command for a speed oriented reading mode is provided, operates said third reading unit when a command for a fine reading mode is externally provided for an operation mode of the image reading apparatus, and operates said fourth reading unit when a command for a super-fine reading mode is externally provided for an operation mode of the image reading apparatus.

10. The image reading apparatus as set forth in Claim 9, wherein said first output unit is designed to synchronize a transfer clock externally input, to transfer pixel signals received from each light receiving element of said first sensor to an adding unit in the arrangement order of the light receiving elements, to output pixel signals added by the adding unit, and to eliminate pixel signals added by said adding unit when reset signals are externally input in synchronization with said transfer clock,

wherein said first reading unit outputs pixel signals added to be consecutive pixel units from said first output unit by setting the cycle length of reset signals input into said first output unit at an integral multiple of the cycle length of said transfer clock, and outputs pixel signals output from the first output unit.

11. The image reading apparatus as set forth in Claim 9, further comprising:

a standard image for brightness determination set at a position where said each sensor can read images, and

a standard image reading unit which acquires pixel signals obtained by reading said standard image by using any of said first, second and third output units

wherein said mode selecting unit is designed so that said mode selecting unit compares a standard value for brightness determination with evaluation value acquired from calculations based on pixel signals read by said standard image reading unit, and said mode selecting unit operates said first reading unit when said evaluation value indicates that it is darker than the state indicated by the standard value.

12. The image reading apparatus as set forth in Claim 11, further comprising a sub scanning unit which changes the relative position of said each sensor and an original copy into a sub scanning direction at a travel speed externally set,

wherein said mode selecting unit sets the travel speed of said relative position changed by said sub scanning unit depending on duration for outputting the amount of pixel signals of one main scanning movement from one reading unit corresponding to an operation mode of the image reading apparatus.



13. The image reading apparatus as set forth in Claim 9, wherein the pixel density of the first sensor in the main scanning direction and the pixel density of the second sensor in the main scanning direction are the same.

14. The image reading apparatus as set forth in Claim 13, further comprising:

a fifth reading unit outputs pixel signals sequentially output from the first output unit as pixel signals, and

a sixth reading unit outputs pixel signals sequentially output from the second and third output unit as pixel signals,

wherein the mode selection unit selectively operates one of the fifth and sixth reading units when the reading resolution specified by an external command is equivalent to the pixel density of the first and second sensor.